REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Rejection of Claim 1 Under 35 USC §102(b) in view of U.S. Patent No. 4,571,011 (Muto)

This rejection has been rendered moot by the addition, to claim 1, of the limitations of claim 3.

The Muto patent clearly does not disclose a freely rotatable washer loosely confined in a space between a rotating race and fixed bearing, as recited in amended claim 1. In fact, Muto does not even disclose a rotatable shaft. Instead, the shaft disclosed in the Muto patent reciprocates axially, is supported by two fixed bearings 22 and 25, and includes an oil scraper 23 *loosely* fitted on the shaft 4. The bearing structure of Muto does not include any structure corresponding to the claimed washer and, while the oil scraper 23 of Muto includes a portion that contacts the shaft seat, it clearly does not contact an *inner* wall of the shaft seat, as claimed, and furthermore is axially movable relative to the shaft rather than rotatable therewith. To accomplish the oil scraping function, the annular oil scraper 23 of Muto is specifically disclosed as being made of a "non-elastic material" (see, *e.g.*, col. 4, lines 57-62 of the Muto patent) which is inconsistent with the loose contact between the race and shaft seat of the claimed invention.

Since the Muto patent fails to disclose a race rotatable with the shaft 4 (or even a rotatable shaft), it clearly could not have suggested a bearing structure in which the radial diameter of a race rotatable with the shaft 4 is substantially equal to an inner diameter of the shaft seat 5a, such that the circumferential edge of the race is almost or slightly in contact with the inner wall of the shaft seat, as also recited in amended claim 1.

As a result, withdrawal of the rejection of claim 1 under 35 USC §102(b) is respectfully requested.

2. Rejection of Claim 2 Under 35 USC §103(a) in view of U.S. Patent Nos. 4,571,011 (Muto) and 6,024,496 (Shy)

This rejection has also been rendered moot by the addition, to claim 1 (from which claim 2 depends), of the limitations of claim 3.

In addition, it is respectfully noted that the Shy patent does not make up for the deficiencies of the Muto patent since the Shy patent also fails to disclose or suggest a washer loosely fitted between a rotatable race and a bearing, or the claimed relationship between diameters of the race and shaft seat, which ensures loose contact between the rotatable race and the shaft seat. Instead, the bearing assembly of Shy uses a conventional rubber ring seal 41 that neither rotates with the shaft nor is at most slightly in contact with the shaft seat, as claimed. Not only does this not suggest the claimed invention, but there is no possible reason for including such a seal in the non-rotating, axially reciprocating-shaft structure of Muto.

As a result, withdrawal of the rejection of claim 2 under 35 USC §103(a) is respectfully requested.

3. Rejection of Claim 3 Under 35 USC §102(b) in view of U.S. Patent Nos. 4,571,011 (Muto) and 4,613,288 (McInerney)

This rejection is respectfully traversed on the grounds that the McInerney patent fails to disclose or suggest modification of an axially reciprocating shaft arrangement of the type disclosed in the Muto patent to include a loose fitting washer and a rotating race having a circumferential edge almost or slightly in contact with the shaft seat, as claimed, thereby providing a more effect seal against dust and oil leakage. Instead, the bearing of McInerney is not sealed, but rather is designed to be lubricated by oil entering through inlet 90 (col. 5, line 66) and exiting through outlet 92 (col. 7, line 61).

The inclusion of a circulating oil arrangement of the type disclosed by McInerney in a reciprocating shaft arrangement of the type disclosed by Muto makes no sense, and the result would not have resembled the claimed invention. The oil circulation of McInerney results from

use of a thrust bearing, which depends on rotation of the shaft. A reciprocating shaft cannot generate such thrust, and the presence of an oil scraper would only interfere with the circulation and likely render the modified Muto structure inoperative. On the other hand, the claimed invention seeks to provide a good seal and prevent loss of lubrication resulting from oil pressure resulting from rotation of the shaft, which is contrary to both Muto and McInerney.

It is respectfully submitted that because of the fundamentally non-analogous motions of the shafts of McInerney and Muto (reciprocating *versus* rotating), and the substantially differences in both the bearing structure and the overall confinement or lack of confinement of the lubricants as disclosed in the two patents, the ordinary artisan could not possibly have been motivated to apply any aspect of the system of McInerney to the device of Muto, and therefore the proposed combination of McInerney and Muto could only have been made in hindsight.

As a result, withdrawal of the rejection of claim 3 under 35 USC §103(a) is respectfully requested.

4. Rejection of Claims 4-8 Under 35 USC §103(a) in view of U.S. Patent Nos. 4,571,011 (Muto) and 4,613,288 (Lowe)

This rejection has been rendered moot by the addition, to claim 1, of the limitations of claim 3.

In addition, it is respectfully noted that the Lowe patent, like the Muto patent, fails to disclose or suggest a race that:

a. is fitted onto and **rotates with** the shaft (as opposed to the shaft rotating relative to a bushing, as in Lowe); and

b. includes a circumferential edge almost or slightly in contact with an *inner* wall of a shaft *seat* (as opposed to being resiliently pressed against the shaft seat, as in Lowe),

as claimed. To the contrary, bushing 68 of Lowe, which the Examiner interprets as an elastic "race," is fixed with respect to the "seat" 20, the shaft rotating relative to the bushing, rather than with the bushing. This is ensured by spring 84 which *axially* compresses the bushing against shaft seat 20 via pressure ring 78. The bushing itself is made of Teflon, so minimize friction between the shaft and the bushing, and is "*placed under axial compression, so as to form a seal between the front part of the housing* [*i.e.*, the so-called "shaft seat"] *and this seal, so as to safeguard against leakage under conditions of extreme low temperature* (col. 2, lines 67-72).

In contrast to the seal of Lowe and the reciprocating shaft scraper structure of Muto, which either rely on a tight fit between the housing or shaft seat and the seal or are designed to permit circulation of lubricant beyond the bearing, the present invention takes the approach of using a rotating race, with at most a slight contact with the shaft seat, to seal in oil and prevent dust ingress. This approach taken by the claimed invention is opposite to those of Muto and Lowe, and therefore the Lowe patent could not possibly have suggested modification of the reciprocating shaft arrangement of Muto to obtain the claimed invention.

Withdrawal of the rejection of claims 4-8 under 35 USC §103(a) is accordingly requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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Date: March 30, 2004

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